PATENT

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July 23, 2009 — Joanne Bourguignon

Date — Joanne Bourguignon

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors: Robert A. Cochran and Gregory D. Dolkas

Serial No. 09/726,852

Filed: November 30, 2000

For: Method and System for Securing Control-Device-Lun-Mediated Access to Luns Provided by a Mass Storage Device

Examiner: Piotr Poltorak

Group Art Unit: 2134

Docket No. 10007240-1

Date: July 23, 2009

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NOTIFICATION OF NON-COMPLIANT APPEAL BRIEF UNDER 37 CFR § 41.37

Sir:

In response to the Appeal Brief filed February 17, 2006 and the Notification of Non-Compliant Appeal Brief under 37 CFR 41.37 dated June 23, 2009, Applicants respectfully submit an amended Appeal Brief that corrects the "Summary of claimed subject matter" appearing on pages 3-4 of the Appeal Brief and correctly maps independent claims 1 and 6 to the specification by PAGE AND LINE NUMBERS.

Applicant believes that no fee is required. However, at any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account No. 50-2976. A duplicate copy of this transmittal letter is enclosed.

Respectfully submitted,
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Enclosures:
Postcards (2)
Amended Appeal Brief

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:

Inventors: Robert A. Cochran and Gregory D. Dolkas
Serial No. 09/726,852
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Examiner: Piotr Poltorak
Group Art Unit: 2134
Docket No. 10007240-1
Date: July 23, 2009

AMENDED APPEAL BRIEF

Commissioner of Patents and Trademarks
Washington, DC 20231

Sir:

In response to the Notification of Non-Compliant Appeal Brief dated June 23, 2009, Applicants hereby submit an amended brief.

REAL PARTY IN INTEREST

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

RELATED APPEALS AND INTERFERENCES

Applicant's representative has not identified, and does not know of, any other appeals of interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1-10 are pending in the application. Claims were finally rejected in the Office Action dated February 28, 2005. Applicant's appeal the final rejection of claims 1-10, which are copied in the attached CLAIMS APPENDIX.

STATUS OF AMENDMENTS

No Amendment After Final is enclosed with this brief. The last Response was filed September 7, 2004.

SUMMARY OF CLAIMED SUBJECT MATTER

The current application is directed towards a method for securing control-device-logical-unit ("CDLUN") operations within a disk-array controller (206 in Figure 2), or in other mass-storage-device controllers, invoked by remote host computers. As explained in the current application in the two paragraphs beginning on line 27 of page 4, a CDLUN is essentially a type of virtual LUN provided by a mass-storage controller to allow remote, host computers to invoke controller functionality involving multiple LUNs. As explained in the current application, beginning on line 16 of page 3, a LUN, or logical unit, represents some portion of the storage capabilities of a mass-storage-device, and a disk-array controller, or other mass-storage-device controller, provides LUNs (208–215 in Figure 2) as interfaces to the various portions, or partitions, of mass-storage space (203-205 in Figure 2) within a mass-storage device (202 in Figure 2). Certain operations, such as LUN mirroring, involve multiple LUNs. The CDLUN was devised as a target for addressing requests by remote host computers to a mass-storage-device controller for multi-LUN, or multi-partition, operations, such as a request to mirror one LUN to a different LUN, and for other mass-storage-device controller operations.

Although CDLUNs serve admirably in the capacity intended, an additional problem was subsequently discovered. In general, access to individual LUNs, and to

operations carried out with respect to individual LUNs, is controlled by various security mechanisms. For example, a remote host computer storing sensitive data on a particular LUN of a disk array generally arranges for the LUN storing sensitive data to be at least write-protected, and often both read-protected and write-protected, so that only the remote host computer, and no other remote host computer, can access the sensitive data. These security mechanisms are easily extended to CDLUNs. Thus, for example, only authorized remote host computers can request mirroring operations through a particular CDLUN. However, these security mechanisms have proven to be inadequate to prevent unauthorized access to individual LUNs as a result of multi-LUN operations requested through CDLUNs. For example, although remote host computer A may have neither read nor write access to LUN X, remote host computer A may still alter the contents of LUN X by, for example, requesting that LUN Y be mirrored to LUN X by sending a multi-LUN request to a CDLUN to which remote host computer A is authorized to send multi-LUN requests. Embodiments of the present invention address this potential security and access problem, and other related problems.

Independent claim 1, and dependent claims 2-5 that depend from claim 1, claim a method for authorizing access by remote entities to logical units provided by a mass storage device. The method includes steps of: (1) providing an access table that includes entries that each represents authorization of a particular remote entity to access a particular logical unit; (2) providing a supplemental access table that includes entries that each represents authorization of a particular control device logical unit to access a particular logical unit; and (3) when a remote entity requests execution of an operation directed to a specified control device logical unit and involving one or more additional specified logical units, authorizing the request for execution of the operation only when an entry currently exists in the access table that represents authorization of the remote entity to access the specified control device logical unit and, for each of the one or more additional specified logical units, an entry exists in the supplemental access table that represents authorization of the specified control device logical unit to access the additional specified logical unit.

Independent claim 6, and dependent claims 7-10 that depend from claim 6, claim an authorization system for authorizing access by remote entities to logical units provided by a mass storage device. The claimed authorization system includes: (1) a request detecting component that detects requests for execution of an operation generated by a remote entity; (2) an access table that includes entries that each represents authorization of a

particular remote entity to access a particular logical unit; (3) a supplemental access table that includes entries that each represents authorization of a particular control device logical unit to access a particular logical unit; and (4) control logic that authorizes a request made by a remote entity, detected by the request detecting component, directed to a specified control device logical unit and involving one or more additional specified logical units only when an entry exists in the access table that represents authorization of the remote entity to access the specified control device logical unit and, for each of the one or more additional specified logical units, an entry exists in the supplemental access table that represents authorization of the specified control device logical unit to access the additional specified logical unit.

In particular, claim 1 is directed to a method for authorizing access by remote entities to logical units (208-215 in Figures 2; page 3, lines 16-29) provided by a mass storage device (202 in Figure 2; page 3, lines 1-15) comprising: (1) providing an access table that includes entries that each represents authorization of a particular remote entity to access a particular logical unit (page 6, lines 7-24; page 9, lines 16-25; page 14, line 18 to page 15, line11); (2) providing a supplemental access table that includes entries that each represents authorization of a particular control device logical unit to access a particular logical unit (page 10, lines 9-20; page 22, line 1 to page 25, line 32); and (3) when a remote entity requests execution of an operation directed to a specified control device logical unit and involving one or more additional specified logical units, authorizing the request for execution of the operation only when an entry currently exists in the access table that represents authorization of the remote entity to access the specified control device logical unit and, for each of the one or more additional specified logical units, an entry exists in the supplemental access table that represents authorization of the specified control device logical unit to access the additional specified logical unit (page 10, lines 9 – 20; page 25, line 32 to page 26, line 12).

Claim 6 is directed to an authorization system for authorizing access by remote entities to logical units (208-215 in Figures 2; page 3, lines 16-29) provided by a mass storage device (202 in Figure 2; page 3, lines 1-15) comprising: (1) a request detecting component that detects requests for execution of an operation generated by a remote entity (page 6, lines 10-15); (2) an access table that includes entries that each represents authorization of a particular remote entity to access a particular logical unit (page 6, lines 7-24; page 9, lines 16-25; page 14, line 18 to page 15, line11); (3) a supplemental access table that includes entries that each represents authorization of a particular control device logical

unit to access a particular logical unit (page 10, lines 9-20; page 22, line 1 to page 25, line 32); and (4) control logic that authorizes a request made by a remote entity, detected by the request detecting component, directed to a specified control device logical unit and involving one or more additional specified logical units only when an entry exists in the access table that represents authorization of the remote entity to access the specified control device logical unit and, for each of the one or more additional specified logical units, an entry exists in the supplemental access table that represents authorization of the specified control device logical unit to access the additional specified logical unit (page 10, lines 9 – 20; page 25, line 32 to page 26, line 12).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether the 35 U.S.C. § 112, second paragraph rejections of claims 1, 2, 4-5, 7, and 9-10, the 35 U.S.C. § 102(e) rejection of claims 1-10 as being anticipated by Ito et al., U.S. Patent No. 6,684,209 ("Ito"), or the 35 U.S.C. 103(a) rejections of claims 1-2, 4, 6-7, and 9 as being obvious over Tulloch, "Administering Internet Information Server 4," New York, McGraw-Hill Professional, 1998, ISBN: 0072128232 ("Tulloch") in view of "Microsoft Windows NT Server, Resource Guide," Microsoft Press, 1996, ISBN: 1,57231,344,7 ("Windows NT"), represent reasonable and substantial new grounds for rejection in the Office Action of November 11, 2005 ("Office Action") that would supplement or eclipse the issues already identified in the Appeal Brief originally filed by Applicants on July 28, 2005.

ARGUMENT

Claims 1-10 are currently pending in the application. In an Office Action dated November 11, 2005 ("Office Action"), the Examiner rejected claims 1, 2, 4-5, 7, and 9-10 under 35 U.S.C. § 112, second paragraph, rejected claims 1-10 under 35 U.S.C. § 102(e) as being anticipated by Ito et al., U.S. Patent No. 6,684,209 ("Ito"), and rejected claims 1-2, 4, 6-7, and 9 under 35 U.S.C. § 103(a) as being obvious over Tulloch, "Administering Internet Information Server 4," New York, McGraw-Hill Professional, 1998, ISBN: 0072128232 ("Tulloch") in view of "Microsoft Windows NT Server, Resource Guide," Microsoft Press, 1996, ISBN: 1,57231,344,7 ("Windows NT"). Applicants' representative respectfully traverses the 35 U.S.C. § 112, second paragraph, 35 U.S.C. § 102(e), and 35

USC § 103(a) rejections, for reasons provided below.

ISSUE 1

1. Whether the 35 U.S.C. § 112, second paragraph rejections of claims 1, 2, 4-5, 7, and 9-10, the 35 U.S.C. § 102(e) rejection of claims 1-10 as being anticipated by Ito, or the 35 U.S.C. 103(a) rejections of claims 1-2, 4, 6-7, and 9 as being obvious over Tulloch, in view Windows NT, represent reasonable and substantial new grounds for rejection that would supplement or eclipse the issues already identified in the Appeal Brief originally filed by Applicants on July 28, 2005.

35 U.S.C. § 112, Second Paragraph Rejections of Claims 1, 2, 4-5, 7, and 9-10

Beginning on line 10 of page 5, a CDLUN is defined as a type of LUN, as follows:

> To reconcile the fact that a number of operations provided to a requesting remote computer by a disk array controller may involve multiple LUNs to the fact that, in general, in invoking any particular operation through many current disk array controller interfaces, *a remote computer must specify a single target LUN*, a type of virtual LUN known as a control-device LUN ("CDLUN") is provided by disk array controllers as part of the interface through which remote computers invoke operations. CDLUNs are essentially points of access to various operations provided by, and carried out by, a disk array controller. (emphasis added)

In the italicized phrase of the above-quoted portion of the specification, it is clear that remote host computers specify operations with respect to a single target LUN. In the underlined phrase of the above-quoted portion of the specification, a CDLUN is defined as a type of virtual LUN. In other words, a CDLUN is a subclass or subtype of the class or type LUN. A host computer requesting an operation to be carried out by a mass-storage controller specifies a LUN target for the operation, and the LUN target can be either a traditional LUN provided by the mass-storage controller or a CDLUN. In the first element of claim 1, an access table is provided "that includes entries that each represents authorization of a particular remote entity to access a particular logical unit." In other words, the access table includes entries corresponding to LUNs accessed by remote entities. It is clear from the definition of CDLUN that these entries may include either traditional LUNs or CDLUNs, a special type of

LUN. In the final element of claim 1, "when a remote entity requests execution of an operation directed to a specified control device logical unit," the request is authorized "only when an entry currently exists in the access table that represents authorization of the remote entity to access the specified control device logical unit." There is nothing unclear or indefinite about this language. The second use of the term "specified control device logical unit" refers to the first instance of the term "specified control device logical unit" in the third element of claim 1, and has full antecedent basis. Moreover, since a control device logical unit is simply one type of LUN, there is absolutely no contradiction between the language of the third element and the language of the first element, in which an access table is described as having entries representing authorization access to logical units. Similarly, there is no contradiction in claim 3, or in any other claims depending from claim 1, with regard to access-table entries.

In Applicants' representative's opinion, the 35 U.S.C. §112, second paragraph rejections of claims 1, 2, 4-5, 7, and 9-10 are unfounded. Moreover, rejections of this nature are not sufficient justification, in Applicants' representative's opinion, for pulling the current application from appeal and reopening prosecution. If 35 U.S.C. §112, second paragraph, rejection remain following disposition of the Appeal, they can be subsequently resolved. The prosecution of the current application has been both time consuming and expensive, and Applicants would prefer that the originally filed appeal proceed to a decision unless relevant new references are cited, or compelling new arguments are offered, by the Examiner.

35 U.S.C. § 102(e) Rejection of Claims 1-10

While Ito discloses subject matter related to the general area of logical units provided by storage subsystems to remote host computers, as does the current application, and unlike the completely unrelated art cited by the Examiner in the subsequently discussed 35 U.S.C. §103(a) rejections, Ito is nonetheless unrelated to the currently claimed invention. First, Ito does not teach, mention, or suggest CDLUNs as defined in the current application. The Examiner appears to have focused on the use of the term "virtual LUN" in the definition of CDLUN, quoted above. Finding that same term used in Ito, the Examiner has apparently concluded that, based on similarity in terminology alone, Ito discloses CDLUNs and supplemental access tables. However, even a cursory reading of Ito reveals that this is not the case. The term "virtual LUN" used in Ito simply refers to a renumbering of LUNs by host

computers for ease of reference. For example, considering Figure 14 in Ito, it is apparent that there is a strict, one-to-one mapping between LUNs and virtual LUNs. This is explained in Ito beginning on line 50 of column 12. Ito's virtual LUN is simply a different numerical value used by a host computer to refer to a LUN provided by a storage subsystem. Ito does not once teach, mention, or suggest a CDLUN that is used by remote host computers as a single target, or single numerical value, to represent controller functionality involving multiple LUNs. For this reason alone, Ito cannot possibly anticipate the claims of the current application, which explicitly recite both LUNs and CDLUNs. Please refer to the Summary of Claimed Subject Matter section of this brief for a concise explanation of CDLUNS.

Secondly, Ito does not teach, mention, or suggest a supplemental access management table, as clearly claimed in current claim 1, and all claims that depend from claim 1. Instead, Ito discloses a single LUN access management table. The single LUN access management table in Ito has entries with three fields: (1) a WWN field that specifies the world-wide name of a particular host computer; (2) the field "virtual LUN" that specifies the numerical values, or virtual LUNs, by which a host computer references LUNs provided by the storage subsystem; and (3) a LUN field that specifies, in one-to-one correspondence with the virtual LUN field entries, the numerical values by which the storage subsystem refers to these same LUNs. The virtual LUN field of each entry of the LUN access management table disclosed in Ito simply serves as a translation device, or dictionary, for translating a numerical value used by a host computer to a corresponding numerical values used by the storage subsystem to reference a single LUN. By contrast, the first paragraph in the Summary of the Invention section of the current application clearly describes a very different access table and supplemental access table used in embodiments of the current invention, and clearly claimed in claims 1-10:

> In one embodiment of the present invention, a disk array controller uses two access tables in order to check for authorization of an operation requested by a remote computer, directed to a target CDLUN, that includes specification of additional LUNs. First, the disk array controller determines whether there is an entry in a first access table having indications of a LUN, port, and remote computer identifier equal to the specified target CDLUN of the request, the port through which the request was received, and the unique identifier of the remote computer from which the request was received. When such an entry is present in the first access table, then the disk array controller assumes that the requesting remote computer is authorized to access the target CDLUN. Next, the disk array controller checks a second, supplemental access table to determine if, for each additional

> LUN specified as part of the request for execution of the operation, there exists an entry containing an indication of the additional LUN paired with an indication of the specified target CDLUN for the operation. Only when the disk array controller finds such an entry in the supplemental access table for each additional LUN specified in the request for execution of the operation does the disk array controller authorize execution of the operation.

The first access table described in the above-quoted portion of the Summary of the Invention section of the current application is similar to the LUN access management table disclosed in Ito, although the first access table of the current invention includes additional fields. However, the supplemental access table of the current invention has no analogy or counterpart in the teachings of Ito. Note that the supplemental access table essentially specifies which LUNs a particular CDLUN may access, or which may be accessed through a particular CDLUN. As described in the above-quoted portion of the Summary of the Invention section, when a host computer specifies a CDLUN target for a requested operation, the storage-system controller first determines, by accessing the first access table, whether the host computer is authorized to access the specified CDLUN. When the host computer is authorized to access the specified CDLUN, then in a second operation, the storage-subsystem controller accesses the supplemental access table to see whether the CDLUN specified by the host computer can access each of the LUNs involved in the operation requested by the host computer. The first access table maps host computers to LUNs, where a LUN may be a traditional LUN or a CDLUN, while the supplemental access table maps CDLUNs to LUNs. Ito does not mention or suggest such a supplemental access table, which is not surprising, since Ito does not teach, mention, or suggest CDLUNs. In the paragraph of Ito beginning on line 60 of column 9, Ito describes use of Ito's LUN access management table. The storage-subsystem controller simply decides whether a host's computer may access a LUN specified by the host computer. There is no second operation undertaken when the specified LUN is a CDLUN for determining whether the specified CDLUN may access particular LUNs involved in the operation.

In M.P.E.P. §2131, the grounds for an anticipation rejection are clearly stated as follows:

> **TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM**
>
> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single

> prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the . . . claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Other than the fact that Ito discloses subject matter related to the general topic of LUNs provided by storage systems to remote host computers, Applicants' representative can see no possible justification for citing Ito against any of the claims of the current application. Ito is unrelated to, and does not teach, mention, or suggest, CDLUNs and supplemental access tables, which, being elements of claim 1 and all claims that depend from claim 1, must be found in order for the cited reference for the cited reference to anticipate the claims. The prosecution of the current application has already proved both time-consuming and expensive, and Applicants would prefer that the appeal process based on the originally filed appeal brief continue unless the Examiner can offer new, relevant references or new and compelling arguments. The 35 U.S.C. §102(e) rejections based on Ito are unfounded, and do not warrant the reopening of prosecution and attendant further delay and expense in resolving the issues to which the appeal is addressed.

35 U.S.C. 103(a) rejections of claims 1-2, 4, 6-7, and 9

The Examiner's 35 U.S.C. §103(a) rejections are not new. They are substantially the same rejections to which the originally filed appeal brief was, in part, directed. In these rejections, the Examiner attempts to draw a correspondence between the mass-storage-controller LUN-access-control methods of embodiments of the present invention to high-level file servers and web servers. As discussed in the originally filed appeal brief, this attempt to cite a general reference discussing administration tools used by human administrators of networked computers against claims directed to a detailed access control method within disk arrays and other storage subsystems is completely unfounded. The originally filed appeal brief discusses these rejections in detail.

The Examiner's position appears to be that, because access is controlled in high-level file systems, an entirely different, and more specific, method for controlling access by remote host computers to low-level logical units provided by a mass-storage controller are obvious. The Examiner, for example, claims on page 10, section 30 of the Office Action that Tulloch teaches control device logical units by referring to an "Internet information server 4.0

that allows administrators to organize web content . . . by using . . . virtual servers." CDLUNs are defined in the current application as a virtual LUN, or logical unit, that serves as a single LUN target for specifying operations by remote host computers to mass-storage controllers that involve multiple logical units, or LUNs, within the mass-storage device. Neither a CDLUN nor a LUN is a virtual server or a server of any kind, and neither has anything whatsoever to do with administrating web content. In section 32 and 33 of the Office Action, the Examiner states:

> Tulloch does not explicitly teach providing a supplemental access table that includes entries that each represent authorization of a particular remote client to access a particular logical unit. However, as indicated above, in process of a CDLUN set up one "maps" the CDLUN to a LUN and thus it is clear that correlation of CDLUN and LUN must be kept in some memory storage by the computer (otherwise there would be no need to explicitly correlate these two entities). Also, it is are old, well-known and widely used in the art of computing to utilize tables to store related information (e.g. Tulloch, pg. 152 Table 4-2). Thus, even though Tulloch does not explicitly teach a supplemental access table it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to keep information comprising CDLUNs with correlating LUNs in a table given the benefit of quick and easy access to related data.

As discussed above, Tulloch neither teaches nor discloses anything related to LUNs or CDLUNs. Thus, the attempt by the Examiner to infer implicit teaching of a supplemental access table that is neither mentioned nor suggested in the reference is, in Applicants' representative's respectfully offered opinion, completely unfounded. The supplemental access table is defined, in the current application, to contain entries that each maps a CDLUN to mass-storage-device-controller-provided LUNs that can be accessed by the CDLUN during a multi-LUN operation specified by a remote host computer. This has nothing to do with web servers, human administrators, or anything else taught, disclosed, mentioned, or suggested in Tulloch. The supplemental access table is claimed, in claim 1, with respect to a well-defined set of steps undertaken by a mass-storage-device controller to authorize a request made by a remote host computer. There is neither mention nor suggestion in Tulloch of any kind of access operation carried out by a mass-storage-device controller on behalf of remote computers. Access control in high-level file systems is not carried out by mass-storage devices, but is instead carried out by operating systems on general purpose computers. Access control in high-level file systems is not carried out on a logical-unit basis,

but is instead carried out on files and directories. The Examiner has apparently failed to grasp the distinction between LUNs and CDLUNs, and thus has failed to point to an object or entity in a high-level file system that serves the same purpose as a CDLUN serves in a mass-storage controller. Finally, Tulloch and Windows NT are very high level, descriptive documents that do not provide technical detail, table structures, or access-control-method algorithms. The Examiner, in section after section of the Office Action, infers an implicit teaching of a specific detail or teaching from a high-level description of generally unrelated file-system objects. This does not constitute finding a teaching, disclosure, or even suggestion of the claim elements of the current claims in Tulloch or Windows NT, but instead constitutes renaming unrelated concepts and entities in the cited references to correspond to claim terms.

In order to establish a *prima facie* case for obviousness, as stated in MPEP § 2143, citing *In re Vaeck*, "[T]he prior art reference (or references when combined) must teach or suggest all the claim limitations." Claim 1 specifically and in great detail claims the access table and supplemental access table of the current invention, along with a clear and detailed description of how a mass-storage-device controller uses the access table and supplemental access table in order to authorize an operation requested by a remote host computer with respect to a CDLUN target. Tulloch and Windows NT are very high-level discussions of human-user administrative interfaces and network security. There is nothing in either reference that teaches, mentions, or suggests an access table and supplemental access table, as claimed in claim 1, nor teach or mention anything at all related to mass-storage-device-controller authorization steps, activities, provision of logical units, or other aspects of embodiments of the current invention.

In the originally filed appeal brief, Applicants' representative has already responded, in detail, to the 35 U.S.C. §103(a) rejections again presented by the Examiner in the Office Action of November 17, 2005. Applicants would prefer not to incur additional time delays and expense in further prosecution of the current application, and would instead prefer to proceed with the appeal to which the originally filed appeal brief was directed, unless the Examiner provides either new, relevant references or compelling new arguments. The 35 U.S.C. §103(a) rejections are neither new nor compelling.

CONCLUSION

The newly asserted 35 U.S.C. § 112, second paragraph, rejections are unfounded, and, in Applicants' representative's opinion, do not justify reopening of prosecution. The Examiner has failed to establish a *prima facie* case for anticipation based on the unrelated reference Ito, and has again failed to establish a *prima facie* case for obviousness in the Examiner's 35 U.S.C. § 103(a) rejections based on the completely unrelated references Tulloch and Windows NT. Reopening of prosecution represents, for Applicants, significant additional expenditure and time delays, and would only be justifiable were the Examiner to point to new, relevant references or to offer new and compelling arguments. Instead, the Examiner has offered only unfounded 35 U.S.C. § 112, second paragraph, rejections, 35 U.S.C. § 102(e) rejections based on reference that does not teach, disclose, or even suggest CDLUNs, supplemental access tables, and many other elements of the claims, and restated unfounded 35 U.S.C. § 103(a) rejections based on the completely unrelated references. Applicants therefore request that the Appeal be reinstated.

Respectfully submitted,
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CLAIMS APPENDIX

1. A method for authorizing access by remote entities to logical units provided by a mass storage device comprising:

providing an access table that includes entries that each represents authorization of a particular remote entity to access a particular logical unit;

providing a supplemental access table that includes entries that each represents authorization of a particular control device logical unit to access a particular logical unit; and

when a remote entity requests execution of an operation directed to a specified control device logical unit and involving one or more additional specified logical units,

authorizing the request for execution of the operation only when an entry currently exists in the access table that represents authorization of the remote entity to access the specified control device logical unit and, for each of the one or more additional specified logical units, an entry exists in the supplemental access table that represents authorization of the specified control device logical unit to access the additional specified logical unit.

2. The method of claim 1 wherein the mass storage device includes ports through which requests from remote entities are received, and wherein authorizing a request for execution is carried out by a controller within the mass storage device.

3. The method of claim 2 wherein the access table includes entries each comprising:

an indication of a logical unit or control device logical unit;

an indication of a port; and

an indication of a remote entity.

4. The method of claim 2 wherein the supplemental access table includes entries each comprising:

an indication of a control device logical unit; and

an indication of a logical unit.

5. The method of claim 2 wherein the mass storage device is a disk array and remote entities are remote computers interconnected with the disk array via a communications medium.

6. An authorization system for authorizing access by remote entities to logical units provided by a mass storage device comprising:

a request detecting component that detects requests for execution of an operation generated by a remote entity;

an access table that includes entries that each represents authorization of a particular remote entity to access a particular logical unit;

a supplemental access table that includes entries that each represents authorization of a particular control device logical unit to access a particular logical unit; and

control logic that authorizes a request made by a remote entity, detected by the request detecting component, directed to a specified control device logical unit and involving one or more additional specified logical units only when an entry exists in the access table that represents authorization of the remote entity to access the specified control device logical unit and, for each of the one or more additional specified logical units, an entry exists in the supplemental access table that represents authorization of the specified control device logical unit to access the additional specified logical unit.

7. The system of claim 6 wherein the mass storage device includes ports through which requests from remote entities are received, and wherein the control logic resides within the mass storage device.

8. The system of claim 7 wherein the access table includes entries each comprising:

an indication of a logical unit or control device logical unit;

an indication of a port; and

an indication of a remote entity.

9. The system of claim 7 wherein the supplemental access table includes entries each comprising:

an indication of a control device logical unit; and

an indication of a logical unit.

10. The system of claim 7 wherein the mass storage device is a disk array and remote entities are remote computers interconnected with the disk array via a communications medium.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.